

CLAIMS

1. A polynucleotide coding for human lactoferrin, characterized in that it has a sequence totally or partially corresponding to the sequence reported as SEQ ID NO:1, and in that said sequence is optimized for the in plant expression.

2. The polynucleotide according to claim 1, said polynucleotide having, fused at the 5'-terminus a sequence selected from the group comprising the sequences represented as SEQ ID NO: 13 and NO: 14.

3. Human lactoferrin, characterized in that it is obtained from the expression of a polynucleotide according to claim 1 or 2.

4. A recombinant DNA vector characterized in that it comprises at least one sequence coding for a gene of interest operatively linked to regulation elements allowing the tissue specific expression thereof.

5. The vector according to claim 4, said regulation elements consisting of a plant expression cassette allowing the tissue specific expression of said gene of interest.

6. The vector according to claim 5, wherein said expression cassette for plants consists of the regulation elements of the gene coding for the protein basic globulin 7 S.

7. The vector according to claim 6, wherein the promoter sequence is SEQ ID NO:21

8. The vector according to claim 5, wherein said expression cassette for plants consists of the regulation elements of the gene coding for for protein  $\beta$ -conglycinine.

9. The vector according to claim 8, wherein the promoter sequence is SEQ ID NO:22.

10. The vector according to any one of the claims 4 to 9, wherein the sequence of the gene of interest is operatively linked to a leader sequence.

11. The vector according to claim 10, said leader

sequence being fused to the sequence coding for the gene of interest.

12. The vector according to claim 10 or 11, said sequence leader being selected from the group comprising the sequences according to claim 2.

13. The vector according to any one of the claims 4 to 12, wherein said gene of interest is the human lactoferrin gene.

14. The recombinant DNA vector according to claim 13, said sequence being the sequence according to claim 1.

15. The vector according to any one of the claims 4 to 14, said vector being a plasmid.

16. The vector according to claim 15, said plasmid being selected from the group comprising pUC, pGEM and pBI.

17. The transformation process of plant cells characterized in that said transformation is performed with a vector according to any one of the claims 4 to 16.

18. Transgenic plant cells characterized in that they can be obtained by transforming of wild type plant cells with a vector according to any one of the claims 4 to 16.

19. Transgenic plant cells characterized in that they contain a gene of interest operatively linked in an expression cassette enabling the tissue specific expression of said gene.

20. The transgenic plant cells according to claim 19, said gene of interest being the one coding for human lactoferrin.

21. The transgenic plant cells according to claim 20, said gene coding for human lactoferrin having a sequence corresponding to the one according to claim 1.

23. The transgenic plant cells according to any one of the claims 19 to 21, wherein said expression cassette includes the regulation region of the gene coding for the 7S basic globulin.

24. The transgenic plant cells according to any one of the claims 19 to 21, wherein said expression cassette includes the control region of the gene coding for the  $\beta$ -conglycinine.

25. Cellular aggregations, characterized in that they can be obtained from cells according to any one of the claims 18 to 24.

26. The cellular aggregations according to claim 25, said aggregations being calluses capable of regenerating transgenic plants.

27. Transgenic plants, characterized in that they can be obtained from the cells according to any one of the claims 18 to 24, by conventional techniques.

28. The transgenic plants characterized in that they contain a gene of interest operatively linked in an expression cassette enabling the tissue specific expression of said gene of interest.

29. The transgenic plants according to claim 28, said gene of interest being the one coding for the human lactoferrin.

30. The transgenic plants according to claim 29, said gene coding for human lactoferrin having a sequence corresponding to the sequence of which at claim 1.

31. The transgenic plants according to any one of the claims 27 a 30, said plants being selected from the group comprising solanaceae, cereals, leguminosae, fruit bearing plants and horticultural plants.

32. The transgenic plant according to claim 31, said plant being soya.

33. The transgenic plant according to claim 31, said plant being tobacco.

34. The transgenic plant according to claim 31, said plant being rice.

35. The transgenic plants according to any one of the claims 27 to 34, said gene being specifically expressed in the storage tissues.

36. The transgenic plants according to claim 35,

said storage tissues being those of the fruit.

37. Use of the transgenic plants according to any one of the claims 27 to 36, as *nutriceuticals*.

38. Production processes of functional foods containing proteins produced by plants, characterized in that the plants according to any one of the claims 27 to 36, are used.

39. The production processes of functional foods according to claim 38, said processes being finalized to the production of vegetal milks, fruit juices, fruit and/or vegetable homogenized foods.

40. The production processes of vegetal milk, starting from proteins in a native and/or concentrated form, characterized in that proteins yielded from transgenic plants according to any one of the claims 27 to 36 are used.

41. The production process of human lactoferrin, characterized in that transgenic plants according to any one of the claims 27 to 36 are used.

42. Human lactoferrin characterized in that it is obtained from transgenic plants according to any one of the claims 27 to 36.